

1,056,706.

Witnesses
E. R. Ruffant.
John J. McCarthy

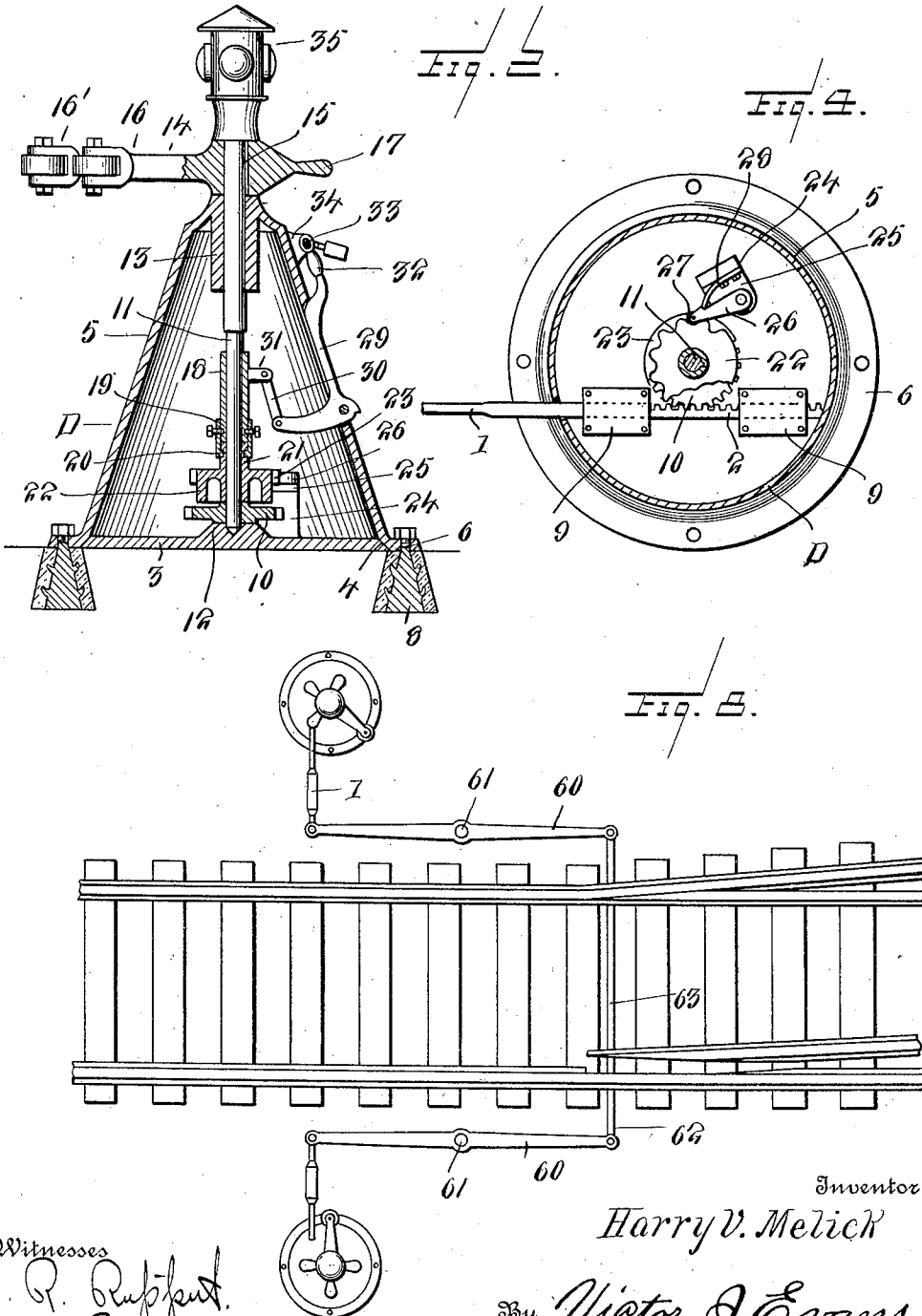
Inventor
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H. V. MELICK.
RAILROAD SWITCH.
APPLICATION FILED MAY 4, 1912.

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Patented Mar. 18, 1913.

3 SHEETS—SHEET 2.



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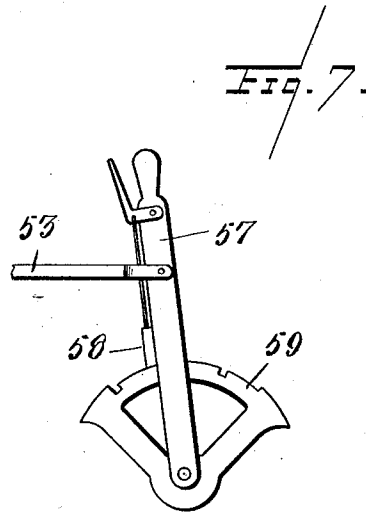
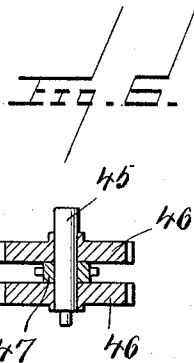
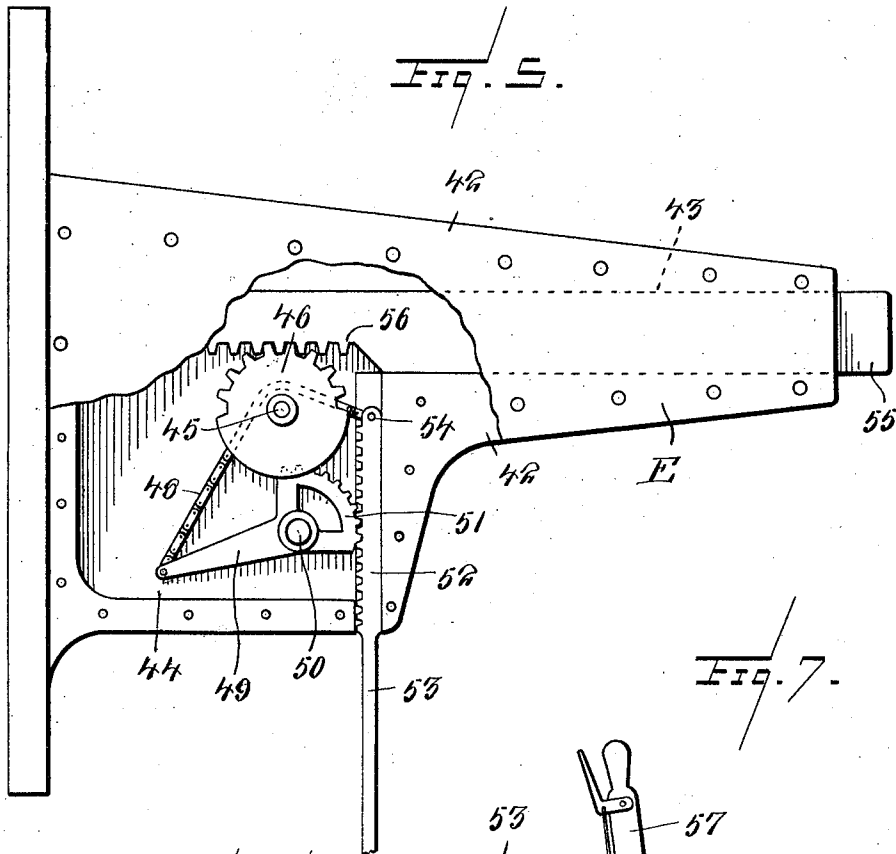
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UNITED STATES PATENT OFFICE.

HARRY V. MELICK, OF AKRON, OHIO.

RAILROAD-SWITCH.

1,056,706.

Specification of Letters Patent.

Patented Mar. 18, 1913.

Application filed May 4, 1912. Serial No. 695,120.

To all whom it may concern:

Be it known that I, HARRY V. MELICK, a citizen of the United States of America, residing at Akron, in the county of Summit and State of Ohio, have invented new and useful Improvements in Railroad-Switches, of which the following is a specification.

This invention relates to improvements in railroad switches and has particular application to automatic switches operable from the train to throw the switch point to open and close a siding, branch line or the like whereby the train may be shunted onto the siding or branch line or continue in its direction of travel on the main line, according to the position of the switch point.

In carrying out the present invention, it is my purpose to provide a switch actuating mechanism connected up to the switch point and operable from a train carried operating mechanism to throw the switch point in one direction or the other according to the direction in which it is desired for the train to travel.

Furthermore, I aim to provide a switch actuating mechanism connected up to the switch point and capable of being operated from a train carried mechanism and manually whereby the switch point may be thrown to the desired position by a switchman.

It is also my purpose to provide an actuating mechanism for switch points which may be operated automatically and manually, locking means being employed and acting to normally hold the actuating mechanism immovable and capable of manual operation to release the switch actuating mechanism so that the same may be operated manually, the locking means being constructed in such manner as to permit the operation of the actuating mechanism from the train carried operating mechanism.

A still further object of this invention is the provision of a train carried operating mechanism which shall include a manually controlled member adapted for operation to affect the actuating mechanism of the switch point so that the train may continue to travel on the main line without affecting the actuating mechanism of the switch, if such is desired.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of parts here-

inafter set forth in and falling within the scope of the appended claims.

In the accompanying drawings; Figure 1 is a top plan view showing the relative positions of the various mechanisms. Fig. 2 is a central vertical sectional view through the switch actuating mechanism. Fig. 3 is a side elevation of the switch throwing rod, parts being shown in section. Fig. 4 is a transverse sectional view of the switch actuating mechanism. Fig. 5 is a side elevation, parts being broken away of the operating mechanism carried by the train. Fig. 6 is a sectional view partly in elevation of a detail of the operating mechanism. Fig. 7 is a side elevation of the lever controlling the operating mechanism, and Fig. 8 is a plan view of a modified form of the invention.

Similar reference characters designate like parts throughout the several views.

In carrying my invention into practice, the actuating mechanism for the switch point, or points as the case may be, is located in advance of the switch point with respect to the siding and at one side of the rails of the main line, and the operating mechanism for the actuating mechanism of the switch is mounted upon the forward part of the locomotive or other car in advance of the front trucks and extends outwardly of the sides of such car and is adapted to engage the switch actuating mechanism to impart movement to the switch point to open the siding or branch line, or is rendered inactive to permit the train to continue on the main line and pass the switch point.

Referring now to the accompanying drawings in detail, A indicates the rails of the main line, B the rails of the siding, branch line or whatever such line may be, and C denotes the movable switch points operable to permit a train to continue on the main line and to shunt a train from the main line to the branch line or siding, according to the position of such point. In this embodiment of my invention, two switch points are shown. It is conceivable, however, that one switch point may be employed at the juncture of the main line or siding or branch line, as found desirable or practical.

Connected to the switch points C is a switch throwing rod 1 extending transversely of the rails of the track and pro-

vided at its end remote from such rails with a rack 2 through the medium of which movement is imparted to the rod to actuate the switch point. Mounted to one side of the rails of the main line is a casing D carrying the actuating mechanism of the switch and composed of a base 3 shown in this instance to be of substantially circular contour and provided with a beveled peripheral edge 4. Surmounting the base 3 of the casing is a tapering body or housing 5 having its relatively large end outturned to provide an annular flange 6 and formed at the juncture of such flange with the body with an inner beveled wall 7 adapted to engage the similar shaped edge of the base 3. This casing is preferably mounted upon a cement, concrete or other foundation, as illustrated in Fig. 2, and the flange 6 on the body 5 of such casing is provided with bolt openings which receive anchors 8 of any suitable or preferred construction which anchors are embedded in the foundation and serve to rigidly and securely hold the casing assembled, and in its applied position.

The rack 2 on the switch throwing bar 1 is passed through suitable alining apertures in the body 5 of the casing and is slidably disposed within spaced alining bearings 9, 9 carried by the base 3 of the casing and arranged in parallelism with the transverse center line of such casing, and meshes with a pinion 10 keyed upon one end of a main shaft 11 arranged vertically within the casing D and journaled at its lower end in a boss 12 carried by the base 3 centrally of the casing and at its upper end in a sleeve 13 depending from the apex of the tapering body of the casing. Thus, in the movement of the main shaft 11, the pinion 10 is rotated to effect sliding movement of the rack 2 and consequently the bar 1 to actuate the switch point to the desired position.

Keyed upon the end of the main shaft 11 exteriorly of the casing D and projecting laterally of such casing and within reach of the operating mechanism on the train, is a manipulating member 14 composed, in the present instance, of a hub 15 through which the projecting end of the shaft 11 is passed and from which radiate arms 16, 16' and handles 17. The arms 16, 16' are adapted to be contacted by the operating mechanism carried by the train to impart movement to the switch throwing rod 1 so that the switch point may be actuated to the desired position, while the handles 17 are designed to facilitate the manual operation of the actuating mechanism when it is desired to move the switch point in this manner.

Splined upon the shaft for sliding movement and within the casing is a sleeve 18 to which is fastened at one end an annular connecting collar 19 provided with an inwardly projecting annular flange 20 adapted to en-

ter a groove formed in a boss 21 located centrally upon an annulus 22 provided upon its periphery for a portion of its width with circumferentially arranged teeth 23. Formed integral with the base 3 of the casing or connected thereto in any suitable manner and projecting upwardly therefrom is a boss 24 and upon this boss 24 is fastened a plate 25 located in proximity to the toothed surface of the annulus 22. Pivotaly mounted upon the plate 25 is an arm 26 carrying at its free end a roller 27 normally engaging the teeth 23 and held in engagement with such teeth by a spring 28 bearing at one extremity upon the arm 26 and having its opposite extremity fastened to a lug on the plate 25. This spring 28 bears upon the arm 26 with sufficient tension to hold the shaft 11 locked against manual operation but permits such shaft to be rotated when the operating device carried by the train contacts with one or the other of the arms 16, 16', the spring 28, in this operation, yielding to permit the teeth 23 on the annulus 22 to pass the roller 27 on the arm 26. The sleeve 18 and its associated parts just described, and the plate 25 and its associated parts form a locking device which normally maintains the actuating mechanism of the switch immovable and is adapted to release the shaft 11 when it is desired to operate or rotate such shaft manually. The release mechanism, for the locking device, herein shown, consists of an angle lever 29 working in a slot formed in the body 5 of the casing D and pivoted at its bight to the walls of such slot and having one of its arms extending into the casing and pivotally connected through the medium of a link 30 with a lug 31 projecting laterally from the sleeve 18, the lug 31 being connected to the sleeve in any suitable manner, or formed integral therewith if desired. The opposite arm of the angle lever 29 is bent upon itself to provide a handle 32 spaced from the proximate portion of the body 5 of the casing and equipped with an eye 33 adapted to be disposed between spaced parallel ears 34 and registering with the apertures in such ears to receive a lock, such as a pad lock or the like to lock the lever 29 against movement by unauthorized parties. Thus, upon pulling the handle 32 of the lever 29, the latter is rocked about its pivotal connection with the body 5 and, through the link 30 and lug 31 elevates the sleeve 18 on the shaft 11 and consequently the annulus 22 to move the teeth on the latter out of engagement with the roller 27 on the arm 26, the roller 27, in the elevated position of the annulus resting upon the peripheral portion of such annulus. Upon the release of the locking device, one of the handles 17 on the manipulating member 14 is grasped and such member rotated to impart movement to the shaft

11 which latter, through the medium of the pinion 10 and rack 2 impart movement to the switch throwing bar 1 to throw the switch point to the desired position. If desired, a signal lamp 35 may be fastened to the end of the main shaft 11 above the manipulating member 14 and provided with suitable bull's eyes to indicate the position of the switch to an engineer of an approaching train.

To prevent derangement of the switch actuating mechanism when a train is upon the switch point and in the event of a projection striking the arms 16 of the manipulating member, I have provided a safety device by means of which the main shaft may rotate within its bearings without affecting the switch, or disrupting the actuating mechanism. This safety device, in the present instance, intersects the switch throwing rod 1 and to accommodate and receive the safety device, the switch throwing rod 1 is formed of sections 36 and 37. Upon the section 36 is bolted or otherwise fastened a cylinder 38, and upon the section 37 is mounted a plunger 39 mounted within the cylinder 38 and adapted to slide therein when the aforementioned conditions prevail. The end of the cylinder 38 within which the proximate extremity of the section 37 is disposed is closed through the medium of a cap 40 threaded onto a nipple carried by the adjacent end of the cylinder or connected to such cylinder in any suitable or desired manner. Mounted within the cylinder 38 and upon opposite sides of the plunger 39 are coiled expansion springs 41, 41 each exerting its tension in opposition to the other and normally maintaining the plunger 39 centrally of the cylinder, the ends of the springs remote from the plunger engaging the proximate ends of the cylinder and cap. The springs 41, 41 are of such strength as to remain immovable or unyielding in the normal operation of the mechanism, thus, presenting to all intents and purposes, an integral and unconnected switch throwing rod. On the contrary, should a projection on the train strike one of the arms 16, when one of the cars of such train is on the switch point, one of the springs 41 will yield, according to the direction of travel of the train and permit the section 37 of the shaft to be moved relatively to the section 36 under the action of the pinion and rack 10 and 2 respectively and the main shaft 11.

In accordance with my present invention, a locomotive or advance car of a train approaching the switch from either the main line or the siding, is equipped with an operating mechanism adapted to engage one of the arms of the manipulating member of the switch actuating mechanism to actuate the switch point to the desired position, such operating mechanism being manually con-

trolled to render the same active and inactive with respect to the actuating mechanism of the switch point. This mechanism embraces a casing E bolted or otherwise secured to the side of the particular car and extending outwardly thereof and mounted in advance of the forward truck. This casing in the present instance consists of two companion sections 42, 42 bolted or otherwise secured to each other and formed to provide an elongated slot or guideway 43 and a substantially rectangular chamber 44 contiguous such guideway, the chamber being designed to house the power appliances while the guideway 43 receives a plunger actuated from the power devices to be rendered operative and inoperative relative to the actuating mechanism of the switch. Journaled in the walls of the chamber 44 of the casing E, is a shaft 45 and keyed upon this shaft are spaced gears 46, 46 and a sprocket 47 intermediate the gears. Operatively engaging the sprocket 47 is a chain 48 one extremity of which is fastened to the arm of a rock lever 49 pivotally mounted upon a shaft 50 in proximity to the shaft 45 and journaled in the walls of the chamber 44. The rock lever 49 at a point opposite its connection with the chain 48 is provided with a segmental or arcuate-shaped rack 51 engaged by a toothed bar 52 integral with a rod 53 and slidably disposed within a suitable guideway formed contiguous the chamber 44 and at right angles to the guideway 43. The opposite end of the chain 48 is fastened to the free end of the toothed bar 52, as at 54. The numeral 55 indicates a plunger slidably mounted within the guideway 43 and equipped with a toothed surface 56 within the guideway and in engagement with the gears 46. Thus, in the operation of the rod 53, sliding movement is imparted to the toothed bar 52 and motion imparted to the plunger 55, through the chain 48, sprocket 47, gears and toothed surface 56 and 56 respectively, to impart movement to such bar 55 to slide the same outwardly or inwardly of the casing E, according to the direction of movement of the rod 53. The rock lever 49, in the movement of the rod 53, serves to keep the chain taut irrespective of the path of movement of the toothed bar 52. The plunger 55 is manually controlled and to this end, the rod 53, which may be of any convenient or suitable length is pivotally connected at its free end to a hand lever 57 provided with a dog 58 adapted to engage notches in a quadrant 59, the movement of the lever 57, when the dog 58 is released, permitting motion to be imparted to the plunger 55, as previously described.

The operation of the mechanism just described may be briefly stated as follows: Assuming a train to be approaching the switch point C from the main line and such

point open, the operation to close the switch so that a train may enter the siding or branch line, is as follows: In the open position of the switch, the arm 16' on the manipulating member is disposed at right angles to the rails of the main line. The operator upon the train now operates the lever 57 and through the power appliances, hereinbefore described, imparts movement to the plunger 55 to move the same outwardly of the casing E and consequently in the path of the arm 16'. Upon the plunger contacting with the arm 16 of the manipulating member of the switch actuating mechanism, the main shaft 11 of such actuating mechanism is operated, and through the medium of the pinion 10 and rack 2 imparts movement to the switch throwing bar 1 to actuate the switch point to close the switch so that the train may proceed from the main line onto the branch line or siding. Upon the train backing out of the siding or branch line, the arm 16' is again contacted by the operating mechanism upon the train to open the switch to the main line.

In the modified form of the invention disclosed in Fig. 8, I employ a switch actuating mechanism at each side of the rails of the main line and each mechanism is arranged an appropriate distance in advance of the switch point and connected to such point through a system of levers. In practicing this form of my invention, each actuating mechanism is equipped with but one arm and owing to the positions of the actuating mechanisms, these arms are disposed at the opposite sides of the track and are adapted for engagement with operating devices carried upon each side of the advance car of a train and extending outwardly thereof. Thus, one of such operating mechanisms on the train may throw the switch to open the siding or branch line to permit a train to enter the same, while a following train or a car at the rear end of the first train may, through its operating mechanism, impart movement to the actuating mechanism upon the opposite side of the track to close the switch to the branch line and permit traffic to continue over the main line without entering the switch or siding. In Fig. 8, each operating mechanism is constructed identical to that hereinbefore described with reference to the preferred form of my invention, but in this form of the invention one of the arms is eliminated as above pointed out, and the switch throwing rod 1 of each actuating mechanism is connected to a lever 60 pivoted upon a suitable support as at 61 and located to one side of the rails of the main line and having its opposite end pivotally connected to a bar 62 common to both levers 60 and fastened to the switch point as at 63. Thus, the switch point may be actuated from either side of the rails of

the main line to accomplish the purposes and results aforesaid.

From the foregoing description taken in connection with the accompanying drawings, the construction, mode of operation and manner of employing my invention will be readily apparent to those skilled in the art to which the invention appertains, and while I have herein shown and described one preferred form of my invention by way of illustration, I do not limit myself to the exact details of construction herein described and delineated as modification and variation may be made within the scope of the claims and without departing from the spirit of my invention.

I claim:

1. In a switch throwing mechanism, the combination with a switch point, of an actuating mechanism therefor, said mechanism including a main shaft, connections between said main shaft and switch point, an annulus splined upon said main shaft for sliding movement and provided with a toothed surface, means normally engaging said toothed surface, to hold the main shaft immovable, and means for moving the toothed portion of said annulus out of engagement with the just-mentioned means to unlock the main shaft for manual operation.

2. In a switch throwing mechanism, the combination with a switch point, of an actuating mechanism therefor, said actuating mechanism including a main shaft, a connection between said main shaft and switch point, an annulus splined upon said main shaft for sliding movement and provided with a toothed surface, an arm normally engaging said toothed surface to hold the main shaft immovable, and manually operable means for moving the toothed portion of said annulus out of engagement with said arm to unlock the main shaft for manual operation.

3. In a switch throwing mechanism, the combination with a switch point, of an actuating mechanism therefor, said mechanism comprising a main shaft, a connection between said main shaft and switch point, an annulus splined upon said main shaft for sliding movement and provided with a toothed surface, a sleeve also splined upon said main shaft and connected to said annulus, means normally engaging said toothed surface to hold the main shaft immovable, and a lever connected to said sleeve whereby the toothed portion of said annulus may be disengaged from the last-mentioned means to unlock the main shaft for manual operation.

4. The combination with a switch point and an actuating mechanism therefor, of an operating mechanism carried by a train and adapted to actuate said actuating mechanism to throw the switch point, said operating

mechanism comprising a plunger, a gear in engagement with said plunger for actuating the same, a rock lever having a segmental rack at one end, a toothed bar in engagement with said rack, a sprocket associated with said gear and adapted to rotate the same, and a chain trained over said sprocket and having one end connected to said toothed bar and the opposite extremity fas-

tened to the free end of said rock arm, and 10 means for actuating said toothed bar.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY V. MELICK.

Witnesses:

PERCY BARKER,

HARRY E. HOOVER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."